

# **ANALYSIS OF SURFACTANTS**

# **ANALYSIS OF SURFACTANTS**

**Second Edition  
Revised and Expanded**

Thomas M. Schmitt

*BASF Corporation  
Wyandotte, Michigan*



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Colloidal Polymers: Preparation and Biomedical Applications, *edited by Abdelhamid Elaissari*



## Preface to the Second Edition

It gives me deep pleasure to offer the second edition of *Analysis of Surfactants*. The nine years since the appearance of the first edition have seen a great expansion in the literature on the analytical chemistry of surface active agents. Incorporating this literature into an updated text has been my only hobby during this time.

The overall organization of the volume is the same. As in the previous edition, the chapters on individual instrumental analytical methods do not describe the theory and practice of the techniques. Rather, they tell generalists what results they can expect from employing the particular method, and allow specialists to immediately discover which approaches their colleagues have found useful. The sections on molecular spectroscopy have been expanded and a chapter on capillary electrophoresis has been added. The chapter on titrations has been reworked to discuss the exciting developments made in the past decade. Some additional surfactants have been added because of their commercial importance—namely, ether carboxylates and ester quats.

Titles of journal articles are included in the references, but they have been truncated, dropping words like *analysis*, *determination*, *quantitative*, *trace*, *new*, *improved*, and so on. Whenever possible, hard-to-get references are omitted in favor of those more recent or more easily obtained. Since about half the copies of the first edition were sold outside the United States, I have taken steps to make the book more useful worldwide by including foreign-language references and translating units of measure as necessary. ISO standards are referenced when available.

Many procedures are described in enough detail to permit an experienced analyst to understand the principles behind the procedures and even to use them for exploratory work. It is expected that the original reference will be obtained if the analyst intends to use a method routinely. It was necessary to omit many of the details required to obtain precise results, particularly in the case of ISO and ASTM standards.

In order to keep the size of the volume within practical limits, I have allowed myself to be more critical in the second edition than the first. Published methodology is not taken at face value, but is put into the context of previous work and evaluated in light of my own thirty years of experience in industrial chemistry. Techniques that are only of academic interest are covered in much less detail than those that have immediate application. I have benefited from reader comments on the first edition, as well as from addressing the hundreds of technical questions asked by my colleagues at BASF and our customers over the years. The purpose remains to give the chemist a ready reference for deciding how best to approach the analytical chemistry challenges that present themselves in the world of surfactants.

*Thomas M. Schmitt*

## **Preface to the First Edition**

This volume is intended to serve as a handbook to the chemist involved in surfactant analysis. Literature is reviewed through 1990, with applications evaluated in terms of their utility in providing accurate analytical results at a reasonable cost. In order to illustrate the various techniques applied to surfactants, some procedures are given in the text. These examples are most often taken from literature that is not readily available because it is somewhat dated or perhaps not written in English. While accurately transcribed, the examples are necessarily abbreviated, and the reader is urged to consult the original source for more information before beginning laboratory work.

I had two objectives: to give the chemist new to a particular area the perspective to begin an analysis, and to provide the more experienced analyst an up-to-date reference book, made accessible by a thorough index. In recognition of usage in modern analytical chemistry laboratories, instrumental techniques are described in preference to “wet chemistry” for both qualitative and quantitative analysis. Chromatographic procedures are emphasized. For the literature prior to 1972, I recommend study of the comprehensive volume of Rosen and Goldsmith.

In addition to covering the determination of surfactants, I have included an extensive section on the characterization of commercial surfactants, including the measurement of parameters affecting purity and suitability for use. This section should

help chemists addressing the very important question of quality of the products their employers buy and sell. Knowledge of the critical parameters of a commercial product will also help the analyst perform a more complete analysis of a formulation containing a surfactant, obtaining enough information to permit prediction and perhaps duplication of its properties.

*Thomas M. Schmitt*

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